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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:

Isao TAKASU et al.

: Group Art Unit: 1755

Application No.: 10/089,302

: EXAMINER: Hailey, PATRICIAL

Filed: March 29, 2002

:

FOR: CATALYST FOR DECOMPOSING

:

ORGANIC HARMFUL

:

SUBSTANCES AND METHOD FOR

:

DECOMPOSING ORGANIC

:

HALIDES BY USE THEREOF

:

DECLARATION UNDER 37 CFR 1.132

Honorable Commissioner of Patents and Trademarks

Washington, D.C. 20231

Sir:

I, Nobuhiko HORIUCHI, declare and state that:

1. I am citizen of Japan, and residing at 2-4-1, Yushudai-nishi, Ichihara city, Chiba, Japan.

In March, 1986, I was graduated from Kyushu University, Faculty of Engineering, Department of Applied Chemistry, and received a degree of Bachelor of Engineering from Kyushu University. In March, 1988, I was graduated from the graduated course of Kyushu University, majoring in Material Science and Technology, and received a degree of Master of engineering from Kyushu University.

In April, 1988, I had been an employee of Mitsui Toatsu Chemicals Inc. I had been assigned to Central Research Laboratory of the above company from April 1988 to November 1990, I had been assigned to Catalysts and Chemicals inc. Far East, from December to July 1994. I had been assigned to Central Laboratory of Mitsui Toatsu Chemicals Inc. from August 1994 from September 1997.

In October 1997, I had been an employee of Mitsui Chemicals Inc. I had been assigned to Petrochemicals Laboratory of the above company from October 1997 to June 1999. I had been assigned to Material Science Laboratory of the above company from July 1999 to March 2002. Till the present time, I have been assigned to Catalysis Science Laboratory of the above company, Heterogeneous Catalysis Group from April 2002.

2. I am a chief researcher for further development of the invention described in the specification of the above-identified application.

3. The following Experiments were carried out in order to clarify the difference between the catalyst of the present invention and that according to USP 4,225,462:

i. Preparation of Catalysts

Catalyst A according to the invention

An aqueous solution of vanadyl sulfate was obtained by dissolving 6.6 g of vanadyl sulfate (purity: 72%) in 21 g of water. As a reinforcing agent, 3.1 g of glass fibers were dispersed in the aqueous solution to prepare Solution A. Separately, 34.2 g of the anatase-type of titanium dioxide, 17.3 g of barium sulfate and 7.7 g of acidic clay as a molding additive were introduced into a kneader having an internal volume of 50 ml and mixed by simultaneously adding Solution A. The mixture was then kneaded by further adding 0.56 g of methylcellulose and 0.28 g of polyethylene oxide as an organic additive and extruded and molded by a extruder into pellets of 3 mm diameter and 10mm length. The pellet-shaped catalyst was dried at 90 °C, for 3 hours and then sintered at 430 °C, for 6 hours. As a result, Catalyst A was obtained, which contained 83 wt. % of the catalyst component composed of 9 wt. % of water-insoluble vanadyl sulfate ( $\beta$ -VOSO<sub>4</sub>), 59 wt. % of titanium dioxide and 32 wt. % of barium sulfate; 12 wt. % of the molding additives; and 5 wt. % of the reinforcing agent.

**Catalyst B as reference according to USP 4,225,462**

Catalyst B was obtained in the same manner as the process for Catalyst A excepted that the anatase-type of titanium dioxide was not added. Catalyst B contained 83 wt. % of the catalyst component composed of 7.5 wt. % of water-insoluble vanadyl sulfate ( $\beta$ -VOSO<sub>4</sub>) and 92.5 wt. % of barium sulfate; 12 wt. % of the molding additives; and 5 wt. % of the reinforcing agent.

**ii. MCB decomposing test**

**Example of the present invention**

A glass-made reactor of 17mm diameter was filled by 22 ml of Catalyst A. A model gas composed of 10 vol. % of oxygen and 90 vol. % of nitrogen, which further contained 15 ppm of MCB, monochlorbenzene, was introduced into the reactor and exhausted gas was discharged to carry out the decomposition reaction at  $6,800 \text{ hr}^{-1}$  of the specific velocity, at 200 °C for 5 hours. The MCB decomposition rate after 5 hour thus obtained is shown in TABLE 1. The decomposition rate was calculated according to the equation : ((MCB concentration at the outlet/MCB concentration at the inlet)  $\times 100$ ).

**Reference Example**

The same test as above was carried except that Catalyst B was used for Catalyst A, and the MCB decomposition rate thus obtained is also shown in TABLE 1.

**TABLE 1**

	Catalyst	Reaction Temperature (°C)	MCB Decomposition rate (%)
Example	A	200	87.6
Reference Example	B	200	26.2

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October 8, 2003

(Date)

Nobuhiko Horiuchi

Nobuhiko HORIUCHI